United Nations E/2013/91

Economic and Social Council

Distr.: General
10 July 2013

Original: English

Substantive session of 2013
Geneva, 1-26 July 2013
Agenda item 2 (b)
High-level segment: annual ministerial review

Letter dated 26 June 2013 from the Permanent Representative of Thailand to the United Nations addressed to the President of the Economic and Social Council

I have the honour to request that the attached report of the Asia and the Pacific Regional Preparatory Meeting on the theme "Science, technology and innovation for promoting renewable energy technologies for sustainable development in Asia and the Pacific" be circulated as a document of the Economic and Social Council for consideration at its substantive session of 2013, under item 2 (b) of the provisional agenda. The Meeting was held in Bangkok on 13 March 2013 in preparation for the annual ministerial review of the Council.

At the Regional Preparatory Meeting, the challenges of using science, technology and innovation for promoting the application and dissemination of renewable energy technologies for sustainable development in the region were examined as a contribution to the theme of the 2013 annual ministerial review, "Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the Millennium Development Goals". The Government of Thailand strongly believes that the report will constitute a valuable contribution to the upcoming discussions in Geneva in July.

(*Signed*) Norachit **Sinhaseni**
Ambassador
Permanent Representative

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Annex to the letter dated 26 June 2013 from the Permanent Representative of Thailand to the United Nations addressed to the President of the Economic and Social Council

Report of the Asia and the Pacific Regional Preparatory Meeting on "Science, technology and innovation for promoting renewable energy technologies for sustainable development in Asia and the Pacific" for the 2013 annual ministerial meeting of the Economic and Social Council

Summary

As part of the preparation of the 2013 annual ministerial review of the Economic and Social Council, a regional meeting was held in Bangkok on 13 March 2013 on the theme "Science, technology, and innovation for promoting renewable energy technologies for sustainable development in Asia and the Pacific". The meeting was hosted by the Government of Thailand and co-organized by the Economic and Social Commission for Asia and the Pacific and the United Nations Department of Economic and Social Affairs.

The meeting brought together a diverse group of stakeholders from the region to discuss the role, benefits and challenges of renewable energy technologies in promoting sustainable energy for sustainable development in the region.

Key policy messages

The following key messages emerged from the discussions.

On promoting the role of renewable energy sources for energy security and sustainability:

- Achieving clean, sustainable, affordable and accessible energy, in particular for the poor, is key to alleviate poverty and achieve sustainable development in Asia and the Pacific
- Renewable energy is one of the most efficient and viable solutions to address sustainable energy and sustainable development challenges, especially in rural and inaccessible areas of many developing countries
- Wider use and dissemination of renewable energy in many developing countries will require increasing national capacity as well as financial incentives to substitute renewable energy sources for conventional ones
- Establishing renewable energy networks and centres of excellence on renewable energy technologies, at both the national and regional levels, will help to promote awareness and readiness for renewable energy and dissemination of renewable energy technologies in developing countries

On ensuring that science, technology and innovation policies and systems promote the use and dissemination of renewable energy:

- Science, technology and innovation can play an important role as a means of implementation for sustainable energy and sustainable development, as long as it is driven by the needs of the poor and the critical objectives of sustainable and inclusive development
- Science, technology and innovation systems focused on renewable energy can help to overcome some of the technological and economic challenges associated with integrating renewable energy technologies in existing delivery mechanisms of energy services, for example in integrating renewable energy technologies with grid-based conventional power supply in rural areas
- Science, technology and innovation agendas, in particular, should explicitly include achievable renewable energy targets
- Policy and institutional frameworks that promote the use of renewable energy technologies in key sectors of the economy which contribute to sustainable development are critical to promote wider dissemination of renewable energy technologies at the national level
- National science, technology and innovation policies that promote the use of renewable energy and renewable energy technologies for sustainable development should also address the interlinkages between energy, water and food security in order to ensure a balanced approach to the three dimensions of sustainable development
- Financial, fiscal and regulatory incentives, together with innovative financial mechanisms and an adequate regime for intellectual property rights, are critical to foster the development, innovation and commercialization of renewable energy technologies

On improving the role of and partnerships with all relevant stakeholders:

- Building collaboration and partnerships within the broad range of stakeholders involved in the value chain from development to commercialization of renewable energy technologies, for example government agencies, research institutes and venture capital, is critical to ensure the adoption and adaptation of renewable energy technologies at the national level
- Promoting collaboration and partnerships with all relevant stakeholders in the renewable energy technology value chain through specific policy measures is also critical to create awareness and build national capacity to disseminate these technologies
- Promoting private sector development in the renewable energy sector will also increase its role in furthering the use and diffusion of renewable energy at the national level

I. Introduction

In July 2013 the Economic and Social Council will hold its seventh annual ministerial review in Geneva. The review will focus on "Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the Millennium Development Goals".

On 13 March 2013, a regional preparatory meeting for the Asia and Pacific region was hosted by the Government of Thailand and co-organized by the Economic and Social Commission for Asia and the Pacific (ESCAP), the United Nations Department of Economic and Social Affairs, and the Asian and Pacific Centre for Transfer of Technology.

The meeting focused on "Science, technology and innovation for promoting renewable energy technologies for sustainable development in Asia and the Pacific". It brought together a diverse group of regional stakeholders, including senior government representatives, experts from the United Nations system, academia, non-governmental organizations (NGOs) and the private sector.

The meeting provided an important opportunity for stakeholders from 25 countries in the Asia and Pacific region to share experiences and best practices and contribute to the preparation of the annual ministerial review.

II. Proceedings of the regional preparatory meeting

A. Opening session

Mr. Shun-ichi Murata, Deputy Executive Secretary, ESCAP, stressed that the outcome document of the United Nations Conference on Sustainable Development had rightly identified energy as a priority area. Access to clean, affordable and sustainable energy was critical to achieve the Millennium Development Goals and socioeconomic development, and renewable energy and energy efficiency were key to increase energy access. He noted that renewable energy development and consumption had grown rapidly in recent years, prompted by climate change concerns, the increased cost of fossil fuel and the need to increase energy security. It now counted for 13 per cent of global primary energy consumption. Further development, utilization and commercialization of renewable energy, as well as energy security and sustainability would largely be driven by science, technology and innovation. Strengthening national science, technology and innovation capacities was thus critical to expand the use of renewable energy. He noted that science, technology and innovation drivers were both external (through technology transfer) and indigenous (advanced local research and development). Effective national science, technology and innovation systems in Asia and Pacific countries were essential to strengthen their innovation capacity and enable them to compete successfully in the global market. He pointed to the tremendous scope for exchanging knowledge, learning and experience within the region about effective national innovation systems that supported the development, transfer and adoption of renewable energy technologies, and welcomed the regional consultation as an important opportunity to do so.

Mr. Néstor Osorio, President of the United Nations Economic and Social Council, in his introductory remarks, drew attention to the enormous global challenges that were putting into question the current development models and sustainable development across the globe, from climate change to food insecurity, global warming and natural disasters. The outcome of the United Nations Conference on Sustainable Development called for a new set of sustainable development goals, embedding a new economic approach that reconciled economic growth with social and environmental objectives. The outcome identified science, technology and innovation as key elements to implement that approach and find viable and sustainable solutions to the developmental challenges of a post-2015 development agenda. It also stressed the role of the Economic and Social Council to provide balanced integration of the three dimensions of sustainable development. The session of 2013 was thus an opportunity for the Council to provide an effective platform for discussing concrete measures to operationalize the sustainable development agenda by identifying innovative solutions to persisting challenges. He added that "The future we want" recognized energy security and sustainability as a critical challenge for many countries, in particular the least developed and small island developing countries, which lacked the financial resources and infrastructure to access modern energy services. The annual ministerial review regional meeting was an opportunity to focus on the role of renewable energy and renewable energy technologies in addressing those challenges.

Mr. Thomas Stelzer, Assistant Secretary-General for Policy Coordination and Inter-Agency Affairs, United Nations Department of Economic and Social Affairs, stressed that harnessing the full potential of science, technology and innovation as enablers for achieving the Millennium Development Goals and sustainable development — as recognized by the outcome of the United Nations Conference on Sustainable Development — required linking the science, technology and innovation agenda more closely to sustainable development challenges. Access to modern energy services, in particular, was key to address some of those challenges. Moreover, increasing demand for fossil fuel-based energy and soaring energy prices had made energy security, sustainability and affordability, especially in poor rural and inaccessible areas, top sustainable development challenges. That state of affairs called for a rethinking of the current global energy system. Renewable energy, in particular, could address many of those challenges. The Secretary-General's initiative, "Sustainable energy for all", indeed recognized energy efficiency and renewable energy as key strategies for achieving energy security. Maximizing the potential of renewable energy sources, however, came with high socioeconomic and cultural costs, which many developing countries could not afford. Science, technology and innovation systems better linked to sustainable development objectives were one way of addressing that challenge and making renewable energy technologies more affordable. There was a need to review current science, technology and innovation systems to ensure that they made the adoption and dissemination of renewable energy and energy efficiency possible for all countries.

Mr. Prasert Sinsukprasert, Director, Planning Division, Department of Alternative Energy Development and Efficiency, Ministry of Energy of Thailand, in his welcoming address, stressed the need to increase access to sustainable and cleaner energy at the local, national and regional levels in order to help countries to reduce emissions and increase their energy security. Thailand had

been successful in attracting private sector investment in renewable energy through various financing schemes and tax incentives, and had installed over 300 megawatts (MW) of power plants. Further progress towards a path of sustainable energy-based economy, however, required science, technology and innovation. He stressed that the annual ministerial review regional meeting was an important opportunity to develop concrete proposals for the region in that regard and to contribute to the 2013 annual ministerial review of the Economic and Social Council and to the work of the High-level Panel on the Post-2015 Development Agenda.

Mr. Agus Rusyana Hoetman, Senior Adviser for Energy and Advanced Material, Ministry of Research and Technology of Indonesia, in the keynote address on "Science, technology and innovation as a means of implementation for sustainable development in the post-2015 development agenda and for global partnership", drew attention to the diminishing world supply of traditional fossil fuel-based energy sources. Nonetheless, demand was growing rapidly in the Asia and Pacific region owing to rapid industrialization, expanding transportation systems, population growth and electrification of rural areas. Oil and coal were increasingly used as main energy sources, raising carbon emissions, while renewable energy sources remained underutilized. He noted that if business continues as usual, by 2020, energy demand in Asia and the Pacific would be dominated by fossil fuel-based energy sources. It was thus critical for countries in the region to start focusing on alternative energy sources, such as hydropower, geothermal, wind and solar energy, and biomass fuel, in their energy mix in order to be able to address sustainable development challenges. Biofuels and biogas, in particular, were increasingly considered as potential new energy sources. Indonesia was a strong supporter of renewable energy, with the objective to achieve more than 17 to 25 per cent of total energy use from renewable energy sources by 2025. Science, technology and innovation, driven by appropriate local and national Government interventions, was deemed to be critical to achieve that objective. In particular, institutional and human resources incentives, research grants and other interventions to facilitate international collaboration and partnerships were deemed to be essential to develop research skills and capacity at the national and regional levels in order to channel research and development efforts into the development, adoption and utilization of renewable energy.

B. Session I: Science, technology and innovation as an enabler for promoting national and regional renewable energy technology innovation systems

Mr. Nazrul Islam, Joint Chief, Power Division, Ministry of Power, Energy and Mineral Resources of Bangladesh, underscored the importance of science, technology and innovation as an enabler for renewable energy technologies, which could have a significant impact on the quality of life of most individuals, but were not widely used. He reiterated the significance of events such as the United Nations Conference on Sustainable Development, the Secretary-General's initiative, "Sustainable energy for all", the International Year of Sustainable Energy for All, as well as the 2013 annual ministerial review regional consultation in Asia and the Pacific to promote a wider use of renewable energy technologies. He focused on the experience of Bangladesh, a highly populated country with low energy consumption of about 265 kilowatt-hours (kWh) per capita owing to limited industrialization

(only 47 per cent of grid electricity was consumed by the industrial sector), which was primarily dependent on gas. Bangladesh had revised its power system master plan in 2010 to match gross domestic product growth of 7 to 8 per cent. The objective of the Government was to increase the country's dependable power capacity, currently standing at 7,500 MW, to produce 39,000 MW by 2030. The Government had also adopted a renewable energy policy in 2008, with a renewable energy target of 5 per cent by 2015 and 10 per cent by 2020, and a target to increase energy efficiency by 10 per cent by 2015. Bangladesh had successfully installed 1.5 million units of solar home systems in rural areas, with Grameen Shakti as the leading NGO installing such systems in the country. Part of that success was the fact that clear targets for renewable energy, addressing both the demand and supply side, had been spelled out in the energy strategy. On the demand side, it aimed at encouraging the business community to use renewable energy, especially in rural areas. Bangladesh had successfully implemented renewable energy programmes (mini-grid, solar) in rural areas through public-private partnerships, for example installation of solar home systems in rural areas with support provided by the Grameen Bank. He stressed that those and other good practices in the region could be shared and benefit other countries. It would thus be useful to establish a dedicated forum on renewable energy which would make that exchange possible and promote renewable energy in the region.

Mr. Rajiv Garg, Programme Officer, United Nations Environment Programme (UNEP), pointed out that technology should be considered as a package which included not only the hardware, but also technical skills, and institutional capacity to handle and modify technology, as needed. He noted that each technology went through a technology cycle. Innovation was critical to allow commercialization within that cycle, while the role of the Government was to facilitate the efficient deployment of technologies through standards, regulations and market access, and the role of business was to provide funding. The efficient deployment of renewable energy technologies, in particular, required creating readiness for climate-friendly technology. That effort entailed capacity and readiness to adapt technology to local conditions and needs. It also required market transformation, which involved creating an environment conducive for climate-friendly technology development through favourable policies, regulations and financial mechanisms and incentives, and disincentives for obsolete technologies. In addition, it required effective networks and areas of excellence at the regional level, for example, through South-South cooperation. UNEP supported all those dimensions. In particular, UNEP had recently created the Climate Technology Centre and Network, a consortium focused on creating readiness. The Centre, in partnership with United Nations Industrial Development Organization would work with national agencies on technology transfer-related issues. It would focus on technology transfer services and capacity-building at the national level in technology development and transfer.

Mr. Akash Bhavsar, Managing Director, SkyQuest Technology Pvt Ltd, India, stressed that only 16.7 per cent of current global energy consumption in the region was from renewable energy sources; the rest was from conventional sources, such as oil and natural gas. Shifting towards a green economy, environmentally and socially sustainable and locally rooted, was critical to make Asia and the Pacific self-sufficient. Green drivers included renewable energy, green buildings, clean transportation and water management. He noted that renewable energy could

promote the achievement of all Millennium Development Goals by improving household practices and providing income generation opportunities. In Asia and the Pacific, renewable energy technologies were used for a wide range of applications, especially to address specific power issues in remote communities, for example by providing off-grid and decentralized energy power systems. Other innovations, such as ocean energy, cellulosic ethanol and geothermal power were becoming popular. He stressed that biomimicking by using nature-oriented technological innovations bore great potential to improve technology efficiency and applications. He underscored that shifting towards a renewable energy-driven economy would require capacity to generate good ideas and research, strong intellectual assets to transform ideas and research into products, and funding to invest in their development and commercialization. The Government played a key role in creating an enabling environment for innovation, for example through appropriate intellectual property systems, policies, institutions, financial mechanisms and incentives, and market opportunities and public-private partnerships, to transform science, technology and innovation into commercially viable and sustainable renewable energy technologies.

A number of points emerged from the debate that followed the round-table discussion. Several participants stressed the need to focus on the impact of all sources of renewable energy in order to understand how research and development help to promote their balanced and sustainable use. For example, it was critical to address the interlinkages between energy, water and food security needs. Other participants argued against setting renewable energy technology targets at the global level, suggested by the Secretary-General's initiative, "Sustainable energy for all", as that was a national responsibility. Many participants stressed the importance of ensuring access to renewable energy technology by all countries in Asia and the Pacific as an effective way to meet the growing energy demand in the region. Promoting advanced fossil fuel technologies (for example, clean coal and natural gas) was also critical, together with safe nuclear energy, because of its huge potential in meeting energy demands. Some speakers stressed the need for renewable energy technologies to reach the Pacific, a region still heavily reliant on fossil fuel. A number of speakers stressed the need to reduce costs and increase access to renewable energy, in particular in rural areas, to meet basic needs through appropriate renewable energy technologies. The Asian and Pacific Centre for Transfer of Technology drew attention to its Renewable Energy Cooperation-Network for the Asia-Pacific, which could provide support to member countries on technology information, choices of technologies, market information and information on policies and institutional frameworks for promoting renewable energy in countries in the Asia-Pacific region. Mr. Bhavsar pointed to several examples of clean energy innovations already commercialized, such as smart-grid technologies, as optimal solutions for meeting energy demands. Waste to energy approaches, such as municipal solid waste technologies, for example, held huge potential for the region. He also noted that South-South cooperation was an important platform to mobilize technology.

C. Session II: Good practices on effective science, technology and innovation policies to promote renewable energy

Mr. Kim Changwan, Deputy Director, New and Renewable Energy Division, Ministry of Knowledge and Economy of the Republic of Korea, provided an overview of the vision and strategy of the Republic of Korea to become a leading country in green energy through technological innovation. He stressed that renewable energy was the new engine of growth. Energy financing mechanisms and institutional framework were equally important to promote that sector and public-private partnerships and government-funded research and development projects played a particularly critical role in that regard. After highlighting some of the good practices in the Republic of Korea for promoting that sector, he pointed to his country's photovoltaic industry programme. With its complete value chain support through the innovative policies of the Government of the Republic of Korea, it was one of the most successful renewable energy programmes in the country, which made the photovoltaic technologies of the Republic of Korea highly competitive in the global market. In the wind energy sector, he drew attention to the unique arrangement in the Republic of Korea between small and medium-sized enterprises and larger companies — where small and medium-sized enterprises worked on individual components in the manufacturing line while the larger companies focused on the finished products — as one of the factors that made for a thriving sector.

Mr. Bibek Bandyopadhyay, Adviser, Ministry of New and Renewable Energy of India, stressed India's keenness to meet its growing energy demand in a sustainable way. India had introduced a national action plan for climate change, with a specific target of reducing carbon emissions and increasing renewable energy commitments to 15 per cent by 2020. In addition, the Government offered tax concessions and concessional customs and excise duty for renewal energy technology development, as well as concessional import duty on imported coal, which was used to fund green technologies. To date, renewable energy accounted for 12.4 per cent of the total installed energy capacity (about 210,645 MW). If large hydropower was also considered, the total contribution of renewable energy would amount to 32 per cent of total installed capacity. Additional skills and financing would be needed to improve that ratio. He noted that India had one of the largest decentralized off-grid energy programmes in the world, with the objective of achieving grid parity by 2022 by increasing domestic manufacturing capacity, manpower and research and development, and by developing an ecosystem for the solar energy sector. Currently, more than 1,000 villages were electrified under the village electrification scheme, while solar plants with about 1,200 MW capacity had been commissioned. He also pointed to the extraordinary job creation potential in the renewable energy sector.

Mr. Md. Sabur Khan, President, and Mr. Nessar Maksud Khan, Senior Vice-President, Dhaka Chamber of Commerce and Industry of Bangladesh, stressed that access to electricity, currently reaching 49 per cent of the population, was a big challenge in the country. The Government looked to renewable energy and the role of the private sector to find solutions to that challenge. Funding would be key to promoting access to renewable energy sources. To date, Bangladesh installed national capacity was about 8,304 MW, 84 per cent of which was generated from natural gas. The country, however, had installed 1.9 million solar home systems, with another 4 million on the way, and the Government was targeting 340 MW of

commercial solar projects and 160 MW of social solar power projects. The biogas programme was also advanced, with 100,000 plants expected to be financed by 2016.

During the ensuing discussion, participants stressed the importance of mobilizing the private sector in developing and disseminating renewable energy technologies. A number of participants underlined the important role of the Government in ensuring that private sector involvement in the renewable energy sector led to solutions benefiting the poor in remote areas. The Government could also be a guarantor for companies that provided services to those underdeveloped areas to secure their revenue. Other participants pointed to renewable energy solutions (for example, solar and hydrogen energy systems, and waste-to-energy) that could be self-sustained, where private companies that supplied energy to poor rural areas would get paid directly by the consumers. Those solutions would benefit both the private sector and the poor, without government intervention in the technology production, which would thus lower its costs. Some participants also stressed the importance of community-based programmes that attracted ownership from local communities as essential for their sustainability.

D. Session III: Regional perspectives and requirements on using science, technology and innovation to promote renewable energy

Mr. Zhongying Wang, Deputy Director, Energy Research Institute, National Development and Reform Commission of China, underscored the important role of renewable energy in promoting sustainable development and enabling technological catch-up in developing countries. While the outcome of the United Nations Conference on Sustainable Development did not agree on a road map for green growth, he noted that many important measures could be taken at the national level to achieve that objective. Renewable energy could indeed replace fossil fuel and countries should not wait for cheaper renewable energy to start using it. Science, technology and innovation could help to reduce its costs significantly. China's five-year plan for renewable energy linked science, technology and innovation to renewable energy technologies to boost its production and achieve national targets. The Chinese solar and wind power ratio was still very low. China, however, had large potential for wind power and produced enough wind turbines for domestic use and export. China's renewable energy targets aimed to achieve 200 GW of wind power and 50 GW of solar photovoltaic power by 2020. Open market policy for wind power (through feed-in-tariff) and fossil fuel or carbon tax were also expected to reduce renewable energy costs and help China to control fossil fuel consumption. The private sector and appropriate public-private partnership models to promote green growth at the national level would also play a critical role.

Mr. Michael Williamson, Head of the Asian and Pacific Centre for Transfer of Technology (ESCAP), stressed the important link between innovation and renewable energy technologies. Innovation at all levels, including at the grass roots, was critical to promote renewable energy. He noted that the Asia-Pacific region was blessed with abundant solar energy resources and solar energy was the third fastest growing energy source in the region. New and innovative technologies could make that source increasingly affordable and thus lead to its growing consumption in the region in place of fossil fuel, which would become increasingly scarce and costly. He stressed that access to renewable energy could promote the achievement of many Millennium Development Goals. Improving access, however,

was a complex operation that required action at various levels, including government investment in science, technology and innovation to reduce production costs and increase efficiency, investment in higher education and communications to increase capacity for renewable energy and awareness about it, market access for renewable energy technologies, enterprise development and access to clean water. In the Asia-Pacific region, in particular, human resources development would be critical to adapt existing renewable energy technologies to local contexts. In that regard, he presented a number of successful case studies from Nepal (Biogas Sector Partnership) and the Philippines (Alliance for Mindanao Off-grid Renewable Energy). That information, together with other services, was available in the Renewable Energy Cooperation-Network for the Asia-Pacific.

In the ensuing discussions, some participants underscored the issue of energy storage, especially for off-grid applications, as a challenge to the broader dissemination of renewable energy in the region. Other participants focused on the importance of technology transfer. They stressed the need for interregional mechanisms, including South-South cooperation and intellectual property systems, to facilitate transfer of technologies that effectively addressed region-specific challenges and built on the abundant renewable energy sources in the region to help countries blessed with those sources to become suppliers. The Asian and Pacific Centre for Transfer of Technology, in particular, stressed the need to increase regional skills to facilitate successful technology transfer. Other participants underscored the importance of having a balanced mix of renewable energy technologies and not relying on a single source. The importance of promoting clean technologies (for example, clean coal utilization and carbon capture technologies) together with renewable energy technologies was also highlighted. A number of participants reiterated that the green growth principles should be adapted to regional and national circumstances, and adopted through national rather than regional policies. Regarding storage, drawing on the distinction between centralized and decentralized energy systems, the Centre underscored the need to ensure that storage became an integral part of off-grid decentralized systems in order to ensure their cost-effectiveness.

E. Session IV: Main messages and policy recommendations to be transmitted to the 2013 session of the Economic and Social Council annual ministerial review

Mr. Surachai Sathitkunarat, Director, Policy Research and Management Department, National Science Technology and Innovation Policy Office. Ministry of Science and Technology of Thailand, reiterated the need to decouple energy and economic growth, and to move away from dependence on oil and gas-fired electricity towards a new and more cost-effective energy paradigm. Drawing from the experience of the Thailand national framework for science, technology and innovation and energy research (Krabi initiative), he pointed to a number of good practices in that regard: national energy science, technology and innovation systems must be strong enough to absorb, adapt, develop, improve, manufacture and diffuse most energy technologies locally in order to achieve sustainable development; and science, technology and innovation policies should be an integral part of the national innovation system and focus on substituting renewable energy sources for traditional ones. He stressed that key factors for a successful energy science,

technology and innovation system were research and development capacity, private sector involvement, technology transfer, human resources development, science, technology and innovation infrastructure and an enabling environment.

Mr. Mohd Khairul Adib Bin Abdul Rahman, Undersecretary, Industry Division, Ministry of Science, Technology and Innovation of Malaysia, drawing from key Malaysian policies (for example, the green technology policy 2009, the national policy on climate change 2009, the Renewable Energy Act 2011, the national renewable energy policy and action plan 2010 and the national energy efficiency master plan of the Energy Commission), stressed the need to improve both energy efficiency and renewable energy consumption as key criteria for sustainable energy. Strategic drivers in that regard were: legal and regulatory frameworks that promoted efficiency; a business environment conducive to renewable energy technologies (for example, energy performance contracting and green procurement); human capital development; enhanced research and development to diversify energy sources and build on indigenous technology (for example, hybrids, energy storage and waste-to-energy); creating public awareness of and advocacy programmes for energy efficiency and renewable energy in all sectors (for example, transportation and private investment); prioritizing energy expenses in the national budget; and establishing clear and achievable national energy targets.

Conclusions and recommendations

Mr. Sinsukprasert reiterated the key role of science, technology and innovation in enhancing renewable energy consumption, improving energy efficiency and lowering energy costs. Science, technology and innovation was a key instrument to achieve the sustainable development agenda and should continue to gain centre stage.

Mr. Stelzer, in his closing remarks, highlighted several key messages that had emerged in the course of the discussions. Firstly, he underscored the centrality of renewable energy as one of the most efficient and viable solutions to promote energy security and sustainability in the region, especially for the poorest and most remote areas. Secondly, he stressed the essential role of national science, technology and innovation policies and systems, as well as research and development agendas, in expanding the use of renewable energy in all countries. Thirdly, he observed that despite considerable efforts made by a majority of countries in the region, many continued to have limited capacity and financial incentives to shift towards renewable energy-led economies. He noted that during the discussions participants had shared useful experiences, initiatives and good practices in that regard. They constituted an important basis to promote effective national science, technology and innovation systems for sustainable development-driven renewable energy technologies and to formulate regional measures to facilitate the transfer and dissemination of climate-friendly technologies. He encouraged all participants to remain engaged with the Economic and Social Council through the 2013 ministerial review, to be held in Geneva in July, where Thailand would share the highlights of the meeting with the Council.

Recommendations

1. Governments should support and promote private sector joint ventures to obtain renewable energy technologies in order to increase their affordability and facilitate their dissemination in the region, especially in the poorest and most remote areas.

2. Governments should strengthen collaboration between small and medium-sized enterprises and larger corporations in the renewable energy sector as an effective way to develop and disseminate renewable energy technologies.

3. Governments should explore innovative financial mechanisms, at both the national and regional levels, to fund the development, transfer and adoption of renewable energy technologies as critical to renewable energy use and diffusion in the region.

4. The private sector must collaborate actively with public enterprises, government nodal agencies and research institutions to gain access to knowledge and resources and work for the common goal of developing effective renewable energy technologies.

5. There is a need to promote flexible intellectual property rights in all countries in the region so that public sponsored research, knowledge and technologies can be shared freely (without intellectual property rights requirements) and accelerate technology transfer in the renewable energy sector for the achievement of the Millennium Development Goals.

6. Governments should focus on the use of renewable energy in the transport sector.

7. Governments should put in place targeted policy interventions to develop effective and efficient energy storage devices for off-grid systems, for example increasing the life and efficiency of batteries in solar energy.

8. There is a need to document cross-border technology transfer experiences in both the public and private domains in order to inform policymakers about which technologies are being transferred to help design effective policies to scale up existing technology transfer initiatives in the renewable energy sector.